

# DOCUMENT TITLE:

## INSTRUMENT EARTHING TYPICAL DIAGRAM

NOTES

FOR GENERAL NOTES REFER TO SHEET NUMBER 03.



**LEGEND**

- IS: Intrinsically Safe
- NIS: Non Intrinsically Safe
- J/BOX: Junction Box
- Ø: Diameter
- ELECT: Electrical
- REF: Reference
- SWA: Steel Wire Armor
- INSTR: Instruments
- MIN: Minimum

**REFERENCE DRAWING**

REFERENCE DRAWING	DRG. No.
Specification For Instrumentation	BK-GHRAI-PEDCO-000-IN-SP-0001
Specification For Control System	BK-GHRAI-PEDCO-000-IN-SP-0002
Specification For Instrument and Control of Package Unit System (PI)	BK-GHRAI-PEDCO-000-IN-SP-0004
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0006
Engineering Standard For Electrical System Design (Industrial and Non-Industrial)	IPB-E-EL-100
Engineering Standard For Transmission Systems	IPB-E-IN-100
Engineering and Installation Standard For Control Centers	IPB-Q-IN-220
Electrical System Design Criteria	BK-GHRAI-PEDCO-000-EL-DC-0001
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0006
Area Earthing Layout In Sishamnan Gas Injection	BK-PPL-PEDCO-320-EL-PY-0001

**KEY PLAN**

REV.	DATE	DESCRIPTION	BY	DATE	CHECKED	BY	DATE	APP.
D02	JUL.2022	IFI	P.HANSAHROH	M.PAKHMAN	M.MOHSEHAD			
D01	APR.2021	IFI	P.HANSAHROH	M.PAKHMAN	M.MOHSEHAD			
D00	DEC.2021	IFI	P.HANSAHROH	M.PAKHMAN	M.MOHSEHAD			

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**BINAK OILFIELD DEVELOPMENT SURFACE FACILITIES GAS & GAS-CONDENSATE PIPELINES**

DATE	SCALE	DRAWING BY	CHECKED BY	PROJECT ENG.

NO CONSTRUCTION PERMITTED UNLESS DRAWING APPROVED

APPROVED FOR CONSTRUCTION	BY:	DATE:

BUDGET REF.	LOCATION	SIZE	CLASS	SERIAL NO.	SHEET	REVISION
0-63-073-0184	F	2	J	708592	4	D02

(VENDOR TITLE BLOCK)\*\*

**DRAWING TITLE:** INSTRUMENT EARTHING TYPICAL DIAGRAM

SCALE	SIZE	DRAWING NO.	SHEET NO.	REV.
NS	A3	BK-PPL-PEDCO-320-IN-DG-0001	01 OF 04	D02

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D02

SHEET NO.	REVISION						SHEET NO.	REVISION						
	D00	D01	D02	D03	D04	D05		D06	D00	D01	D02	D03	D04	D05
1	X	X	X				41							
2	X	X	X				42							
3		X	X				43							
4		X	X				44							
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Specification For Instrumentation	BK-GHRAI-PEDCO-000-IN-SP-0001
Specification For Control System	BK-GHRAI-PEDCO-000-IN-SP-0002
Specification For Instrument and Control of Package Unit System (PUS)	BK-GHRAI-PEDCO-000-IN-SP-0004
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0006
Engineering Standard For Electrical System Design (Industrial and Non-Industrial)	IPB-E-EL-100
Engineering Standard For Transmission Systems	IPB-E-IN-100
Engineering and Installation Standard For Control Center	IPB-O-IN-220
Electrical System Design Criteria	BK-GHRAI-PEDCO-000-EL-SP-0008
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0005
Area Earthing Layout in Siahmahan Gas Injection	BK-PPL-PEDCO-320-EL-PY-0001

KEY PLAN

D02

REV.	DATE	DESCRIPTION	BY	DATE	CHECKED	BY	DATE	REV. APPR.
D02	JUL.2022	IFI	P.HAJIABADI	M.PAKHMAN	M.MOHSEDI			
D01	APR.2021	IFI	P.HAJIABADI	M.PAKHMAN	M.MOHSEDI			
D00	DEC.2021	IFI	P.HAJIABADI	M.PAKHMAN	M.MOHSEDI			
REV.	DATE	P.O.I.S	PREP.	CHEK.	APP.	AUT.		

PROJECT NAME: BINAK OILFIELD DEVELOPMENT/SURFACE FACILITIES GAS & GAS-CONDENSATE PIPELINES

PROJECT NO.: 971020

EPC CONTRACTOR: HIRGAN ENERGY - DESIGN & INSPECTION COMPANIES

EPC CONTRACTOR (GC): PETROIRAN DEVELOPMENT COMPANY

DRAWING TITLE: INSTRUMENT EARTHING TYPICAL DIAGRAM

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0-63-073-0184	F	2	J	708592	4	D02

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- CABLE SCREENS SHALL BE EARTHED AT ONE POINT ONLY THIS SHALL BE AT THE INSTRUMENT EQUIPMENT ROOM EARTH BARS. CONTINUITY OF THE SIGNAL SHALL BE MAINTAINED THROUGHOUT THE CABLE RUN.
- FIELD JUNCTION BOXES TO BE DEDICATED TO ONE SIGNAL CATEGORY ONLY.
- I.S. AND NON-I.S. SIGNALS/CABLES SHALL NOT BE MIXED.
- ALL SPARE CORES WITH IN FIELD I.S. MULTICORE CABLES SHALL BE CONNECTED TO I.S. TERMINALS AT BOTH ENDS AND EARTHED DOWN AT LOCAL EQUIPMENT ROOM TO THE CLEAN EARTH.
- INTERCONNECTION BETWEEN EARTH BARS SHALL BE DOUBLE BOLTED FOR SECURITY.
- CABLE TRAY TO BE EARTED AT EACH END OF A RUN.
- TAPE AND INSULATE NON GROUNDED ENDS OF SCREENS OF SIGNAL CABLES.
- FIELD EARTHING FOR INSTRUMENT EQUIPMENT TO BE TERMINATED AT LOCAL EARTHING BARS (SUPPLIED BY ELECT GROUP).
- WHERE BARRIERS ARE BAR (AS OPPOSED TO RAIL) MOUNTED THEN MOUNTING BAR TO BE INSULATED & LINKED TO INSTRUMENT EARTH.
- THE RESISTANCE TO EARTH FOR THE INSTRUMENT EARTH AND I.S. EARTH SHALL BE LESS THAN 0.5 OHM INDEPENDENTLY OF SAFETY EARTH.
- CABLE SWA WILL BE EARTHED VIA THE CABLE GLAND TO THE JUNCTION BOX/LOCAL CONTROL PANEL.
- FOR INTERCONNECTING HARDWIRED CABLES BETWEEN THE MAIN CONTROL BUILDING AND OTHER BUILDING, SCREEN SHALL BE EARTHED AT THE MAIN CONTROL BUILDING ONLY.
- SCREEN EARTHED AT SYSTEM CABINET OR MARSHALLING CABINET ONLY.
- EARTHING OF DATA HIGHWAYS ACCORDING TO SYSTEM SUPPLIER'S REQUIREMENTS.
- THIS DRAWING IS A "PHILOSOPHY ONLY" DRAWING SPECIFIC EARTHING REQUIREMENTS WILL BE SHOWN ON EARTHING SCHEMATICS OR SYSTEM SUPPLIER'S DOCUMENTATION.
- EARTH RESISTIVELY AT SITE IS REFERRED TO EARTHING SYSTEM CALCULATION BASED ON THE GEOTECHNICAL STUDY OF SITE.
- SYSTEM REF. EARTHS ARE NOT PREFERRED.

- SCREENS OF CABLES CARRYING I.S. SIGNALS SHALL BE CONNECTED TO AN EARTH BAR SEPARATED FROM EARTH BAR USED FOR SCREENS OF CABLES CARRYING NON I.S. SIGNALS.
- NOT APPLICABLE TO DCS, ESD AND F&G AS PER VENDOR'S REQUIREMENT (SYSTEM EARTH FOR SAFETY SYSTEM IS INTEGRATED INTO SAFETY EARTH AS PER VENDOR'S STANDARD).
- GROUNDING CABLE FOR ONLY SAFETY SYSTEM CABINET (ESD, F&G) SHALL TO GROUNDING BAR INDIVIDUALLY.
- ALL INTERCONNECTIONS BETWEEN EARTH BARS TO BE 35mm CONDUCTORS.
- ALL EARTH STUDS FOR JUNCTION BOXES J/BOX FRAMES ETC. SHALL BE 10mm DIA. MIN.
- ALL INSTRUMENT STANDS, JUNCTION BOXES, CABLE RACK, TRAY AND TRUNKING ETC SHALL BE CONNECTED TO PLANT EARTH BY 16mm INSTALLATIONS OVER 20m IN LENGTH 10mm FOR INSULATIONS LESS THAN 20m LENGTH. COLORED YELLOW/GREEN.
- ALL WIRE LINK CONNECTIONS TO EARTH BARS IN EQUIPMENT CABINETS SHALL BE 1.00mm PVC COVERED CONDUCTORS (YELLOW/GREEN)
- ALL EQUIPMENT CABINET/PANEL EARTH BARS TO BS2874(C-103) OR EQUIVALENT AND OF 75mm CROSS SECTIONAL AREA (MIN.) BARS MOUNTED ON INSULATORS SHALL BE SPACED AT A MIN. OF 25mm FROM CABINET FRAME.
- TWO IDENTICAL INSULATED 70mm CONDUCTORS OF THE SAME LENGTH SHALL BE BOLTED TO THE INSTRUMENT EQUIPMENT ROOM EARTH BAR INSTALLATIONS AND TO PLANT EARTH SYSTEM OR MASTER REF GROUND ELECTRODE (BY ELECT DEPT) CONDUCTORS TO BE SPACED 150mm APART (MIN).
- CABLES SHALL BE CLAMPED TO A RAIL AT THE BASE OF THE CABINET. THE INSULATION AND ARMOUR IS TO BE CUT BACK AND THE ARMOUR CONNECTED TO THE NON-INSULATED SAFETY EARTH USING 2.5mm EARTH CABLE.
- INSTS/JUNCTION BOXES AND ARMOUR OF FIELD CABLES MAY BE BONDED TO OTHER STAND/FRAMES WITH 6mm CONDUCTOR. THE STAND OR FRAME IS THEN BONDED TO PLANT EARTH IN ACCORDANCE WITH NOTE-23.
- ALL WIRE LINK CONNECTION TO EARTH BARS IN EQUIPMENT CABINETS SHALL BE A MIN. 1.5mm PVC COVERED CONDUCTORS.
- EARTH BUSES SHALL BE TYPICALLY COPPER, 6 mm THICKNESS AND 40 mm WIDE (IPS-G-IN-220(1))

- EARTH BAR FOR PE. , I.S & N.I.S. ARE SEPARATE FROM EACH OTHER.
- MIN DISTANCE BETWEEN P.E. AND C.E. EARTH TB BE 20 METER.
- FOR MTO PLEASE REFER TO MTO For EARTHING & LIGHTING SYSTEM IN SIAHMAKAN GAS INJECTION. DOC. NO. BK-PPL-PEDCO-320-EL-MT-0001)

NOTES

FOR GENERAL NOTES REFER TO SHEET NUMBER 03.



LEGEND

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Specification For Control System	BK-GHRAI-PEDCO-000-IN-SP-0002
Specification For Instrument and Control of Package Unit System (PI)	BK-GHRAI-PEDCO-000-IN-SP-0004
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0006
Engineering Standard For Electrical System Design (Industrial and Non-Industrial)	IPS-E-EL-100
Engineering Standard For Transmission Systems	IPS-E-IN-100
Engineering and Installation Standard For Control Cables	IPS-G-IN-220
Electrical System Design Criteria	BK-GHRAI-PEDCO-000-EL-DC-0001
Specification For Earthing & Lightning System	BK-GHRAI-PEDCO-000-EL-SP-0006
Area Earthing Layout in Steamline Gas Injection	BK-PPL-PEDCO-320-EL-PY-0001

KEY PLAN

REV.	DESCRIPTION	BY	DATE	CHECKED	REV. APPR.					
D02	JUL.2022	IFI	P.HANSAIDH	M.PAKHARAN	M.MOHSEAD	00.00	00.00	00.00	00.00	00.00
D01	APR.2021	IFI	P.HANSAIDH	M.PAKHARAN	M.MOHSEAD	00.00				
D00	DEC.2021	IFI	P.HANSAIDH	M.PAKHARAN	M.MOHSEAD	00.00				

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 PROJECT NO.: 971020  
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 EPD/EPC CONTRACTOR (GC): PETROIRAN DEVELOPMENT COMPANY

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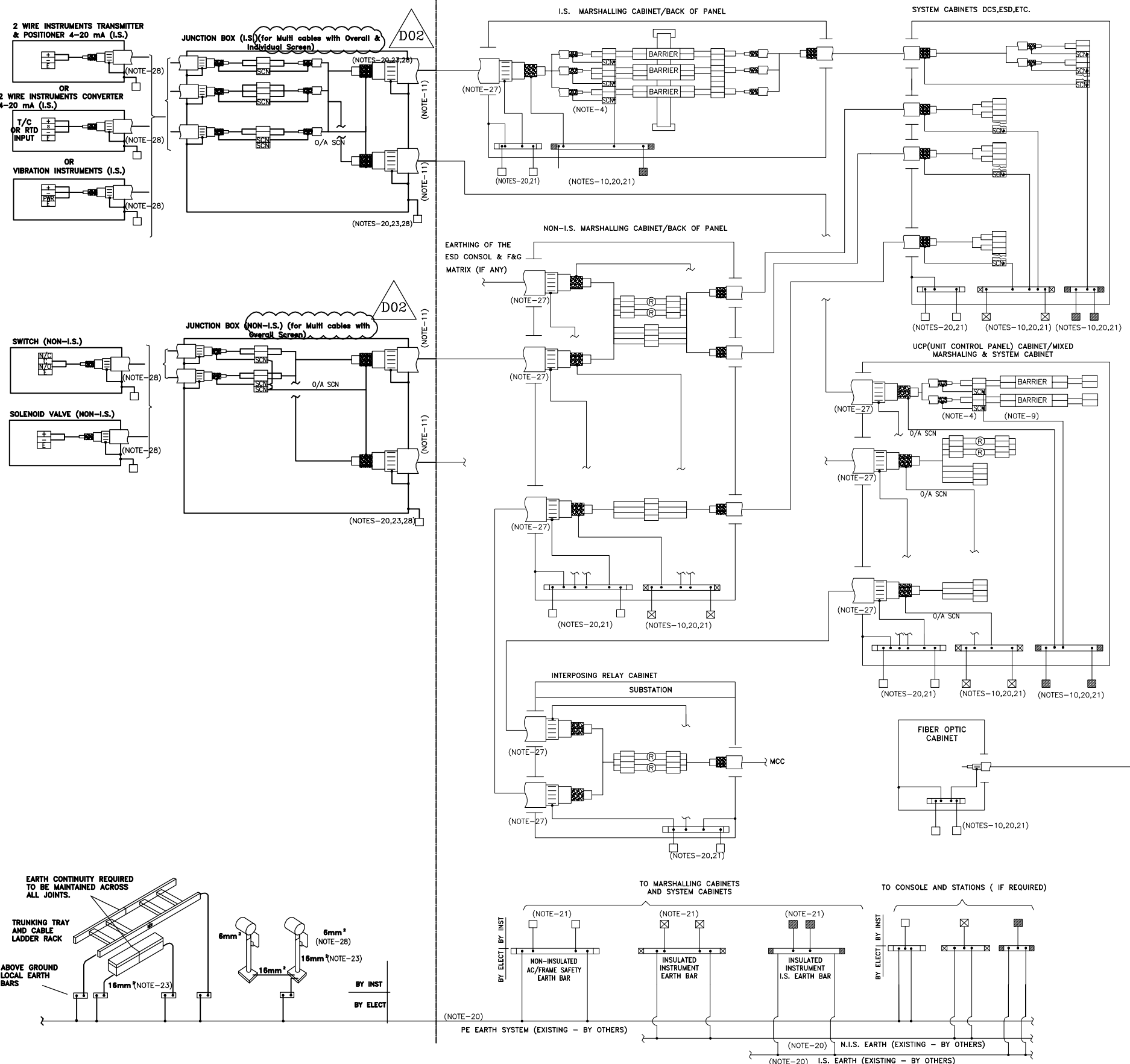
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SCALE	SIZE	DRAWING NO.	SHEET NO.	REV.	BUDGET REF.	LOCATION	SIZE	CLASS	SERIAL NO.	SHEET	REVISION
NS	A3	BK-PPL-PEDCO-320-IN-DG-0001	03 OF 04	D02	0-63-073-0184	F	2	J	708592	4	D02

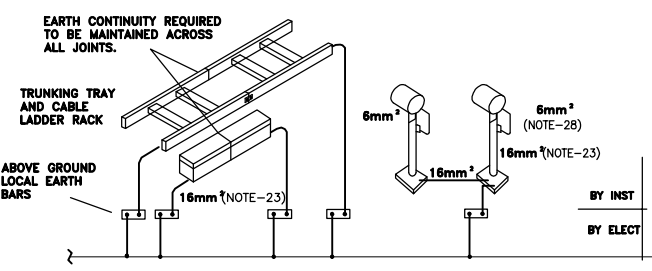
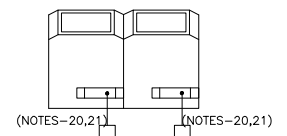
(VENDOR TITLE BLOCK)\*\*

NEW EXISTING CONTROL ROOM (OUT OF SCOPE)

NOTES  
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EARTHING OF THE OPERATOR CONTROL STATIONS WITH IN THE CONTROL BUILDING WILL BE AS THE SUPPLIER'S REQUIREMENTS.



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Engineering Standard For Electrical System Design (Industrial and Non-Industrial)	IPB-E-EL-100
Engineering Standard For Transmission Systems	IPB-E-IN-100
Engineering and Installation Standard For Control Cables	IPB-O-IN-200
Electrical System Design Criteria	BK-GHRA-PEDCO-000-EL-DC-0001
Specification For Earthing & Lightning System	BK-GHRA-PEDCO-000-EL-SP-0006
Area Earthing Layout In Substation-Gas Injection	BK-PPL-PEDCO-320-EL-PY-0001

KEY PLAN

LEGEND

TYPICAL CABLE CONSTRUCTION	TYPICAL CABLE CONNECTIONS	PLUG/SOCKET CONNECTIONS	SYMBOLGY	ABBREVIATIONS
				ESD DCS I.S. SCH O/A C N/C PWR EMERGENCY SHUTDOWN DISTRIBUTED CONTROL SYSTEM INTRINSIC SAFETY SCREEN OVERALL COMMON EARTH NORMALLY OPEN NORMALLY CLOSE POWER

REV.	DATE	DESCRIPTION	BY	DATE	BY	DATE
D02	JUL.2022	IP1	P.HANSAHROOH	M.PAKHARAN	M.MORSHAD	00.00
D01	APR.2021	IP1	P.HANSAHROOH	M.PAKHARAN	M.MORSHAD	00.00
D00	DEC.2021	IP1	P.HANSAHROOH	M.PAKHARAN	M.MORSHAD	00.00
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NS	A3	BK-PPL-PEDCO-320-IN-DG-0001	04 OF 04	D02

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0-63-073-0184	F	2	J	708692	4	D02

(VENDOR TITLE BLOCK)\*\*